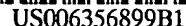


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44	BRS	30	(significan\$5 with affinity) same itera\$8	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/09/09 09:32		0
45	BRS	30	((significan\$5 with affinity) same itera\$8) and similar\$5	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/09/09 09:38		0
46	BRS	157	(significan\$5 with affinity) with similar\$5	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/09/09 09:38		0
47	BRS	11	((significan\$5 with affinity) with similar\$5) and itera\$8	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/09/09 09:40		0
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49	BRS	351	"affinity value"	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/09/09 09:41		0
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(45) Date of Patent: \*Mar. 12, 2002

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(74) Attorney, Agent, or Firm—John L. Rogitz

(57) **ABSTRACT**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: 09/261,926

(22) Filed: Mar. 3, 1999

### Related U.S. Application Data

(63) Continuation-in-part of application No. 09/143,733, filed on Aug. 29, 1998.

(51) **Int. Cl.<sup>7</sup>** ..... **G06F 17/30**

(52) U.S. Cl. .... 707/5; 707/3; 707/4; 707/104

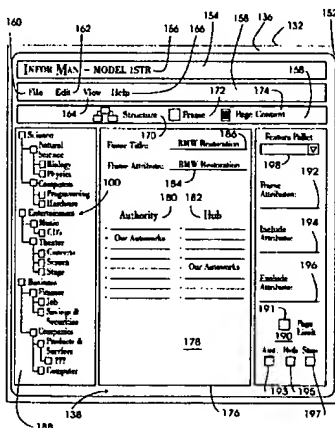
(58) **Field of Search** ..... 707/1, 3, 4, 5,  
707/104; 709/218, 219

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**50 Claims, 19 Drawing Sheets**



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US006112202A

# United States Patent [19]

Kleinberg

[11] Patent Number: 6,112,202

[45] Date of Patent: Aug. 29, 2000

[54] **METHOD AND SYSTEM FOR IDENTIFYING AUTHORITATIVE INFORMATION RESOURCES IN AN ENVIRONMENT WITH CONTENT-BASED LINKS BETWEEN INFORMATION RESOURCES**

[75] Inventor: Jon Michael Kleinberg, Los Gatos, Calif.

[73] Assignee: International Business Machines Corporation, Armonk, N.Y.

[21] Appl. No.: 08/813,749

[22] Filed: Mar. 7, 1997

[51] Int. Cl.<sup>7</sup> ..... G06F 17/30

[52] U.S. Cl. .... 707/5; 707/9; 707/101

[58] Field of Search ..... 707/1, 2, 4, 5, 707/10, 100, 101, 102, 501

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*Primary Examiner*—Thomas G. Black

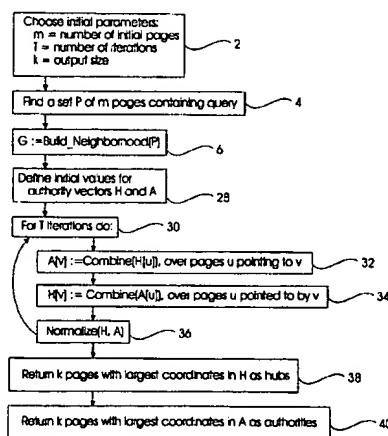
*Assistant Examiner*—John Loomis

*Attorney, Agent, or Firm*—Khanh Q. Tran

[57] **ABSTRACT**

A system and method are provided for searching for desired items from a network of information resources. In particular, the system and method have advantageous applicability to searching for World Wide Web pages having desired content. An initial set of pages are selected, preferably by running a conventional keyword-based query, and then further selecting pages pointing to, or pointed to from, the pages found by the keyword-based query. Alternatively, the invention may be applied to a single page, where the initial set includes pages pointed to by the single page and pages which point to the single page. Then, iteratively, authoritativeness values are computed for the pages of the initial set, based on the number of links to and from the pages. One or more communities, or "neighborhoods", of related pages are defined based on the authoritativeness values thus produced. Such communities of pages are likely to be of particular interest and value to the user who is interested in the keyword-based query or the single page.

57 Claims, 5 Drawing Sheets



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